

# Non-Crystalline Silica (NCS) *made from* Pure White Pumice

*Hess Pumice NCS Products: A non-crystalline silica with all the benefits of CS and none of the health risks.*

## A Functional Filler and Extender

Hess Pumice Products mines and refines the world's purest commercial deposit of white pumice, and from that pumice produces a line of micronized, non-hazardous amorphous silica products for functional fillers and extenders in paints, coatings, rubber, and plastics.

Alternatives for Crystalline Silica (CS) fillers have been few and often hard to source—until now. Our line of Non-Crystalline Silica (NCS) grades have all the beneficial features of CS without the carcinogenic health risks.

Pumice is a foamy volcanic glass (it has no crystal structure) made up of silica, alumina and small amounts of calcium, magnesium, potassium, etc., with the respirable portion (PM10) crystalline silica-free.

Our NCS products are inert, near white, pH of 7.2, with unit weights (loose) ranging from approximately 1.6 kg/gallon for the finer grades up to approximately 3 kg/gallon for the coarser grades.

They also have outstanding scrub, burnish, and stain resistance properties due to the hardness of the particles (5.8 - 6.1 Mohs).

## Crystalline Silica: Workplace Safety and Health Issues

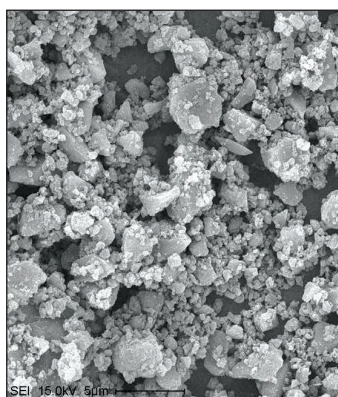
Crystalline Silica (respirable) has been identified by the International Agency for Research on Cancer (IARC) as a "Group 1" carcinogen. OSHA therefore requires all products containing more than 0.1% crystalline silica to be labeled as a cancer hazard.

Respirable Crystalline Silica is federally regulated by the EPA, FDA, & OSHA. NIOSH also considers crystalline silica to be a carcinogen.

## Replacing Crystalline Silica

Our NCS products have a lower density and must replace CS— or any other filler—on a volume basis, rather than by weight. This results in higher bulking values and higher yields per pound of NCS product verses CS product.

Gloss and sheen control with NCS is, in general, equal to and usually better than CS products. Hiding power can also be improved using NCS products. Additionally, NCS products work well as a replacement for Zeospheres in coatings.



## HESS PUMICE NCS GRADES

NCS-3	The Grade Numbers indicate the average particle size in microns.
NCS-5	
NCS-8	
NCS-10	
NCS-12	
NCS-15	

## CHEMICAL ANALYSIS & PROPERTIES

**Chemical Name:** Amorphous Aluminum Silicate

### TYPICAL CHEMICAL ANALYSIS

Silicon Dioxide - 76.2 %
Aluminum Oxide - 13.5 %
Ferric Oxide - 1.1%
Ferrous Oxide - 0.1%
Sodium Oxide - 1.6%
Potassium Oxide - 1.8%
Calcium Oxide - 0.8%
Titanium Oxide - 0.2%
Magnesium Oxide - 0.05%
Moisture - <1.0 %

### GENERAL PHYSICAL PROPERTIES

Hardness (Mohs) - 5.8 - 6.1
pH - 7.2
Radioactivity - 0
Crystalline SiO <sub>2</sub> - None Detected
HMIS - 0
Softening Point - 900 degrees C
GE Brightness - 84

Have specific questions?  
Want to do in-house testing in  
your own lab? Contact us.



### Hess Pumice Products

Post Office Box 209; 100 Hess Drive  
Malad City, Idaho 83252  
1.800.767.4701 x 111  
brian@hesspumice.com • hesspumice.com

## Properties for Coatings

Hegman results start at approximately 5 for the coarser grades. Oil absorption ranges between 30% to 40% depending on the grade. These products are also known for their outstanding durability & weathering properties, including no known instance of frosting or chalking after several years exposed to the elements. NCS grades are also used in sheen control applications.

## Applications

Applications for the Hess Pumice Non-Crystalline Silica fillers include:

- Industrial Coatings
- Architectural Paints
- Wood Stains
- Exterior Coatings
- Rubber Compounds
- Plastics/Fiberglass Compounds
- Silicones/Caulkings
- Epoxies

## Availability and Packaging

Hess Pumice NCS products are shipped world-wide with standard packaging being in 20 kg poly-lined bags, 50 lb poly-lined paper bags, 500 kg bulk bags, and 2000 lb bulk bags.

## Request a Sample of our NCS

Call for a sample of the brightest and hardest Amorphous Aluminum Silica commercially available in the world.

**SALES:** If you need to talk availability, grades or grade blends, logistics, costs—contact Mike Hess Jr., Sales Manager, at extension 147 or email [salesmgr@hesspumice.com](mailto:salesmgr@hesspumice.com)

**RESEARCH:** Perhaps you are exploring the possibilities—thinking pumice may fit your particular filler extender need, thinking you'd like to run some tests—then we invite you to contact Brian Jeppsen, VP Research and Development, at (208) 766-4777 x111 or email: [rd@hesspumice.com](mailto:rd@hesspumice.com). ■

## EXPOSURE TESTS

PAINT #	EXTENDER	COLOR	GEN APP	CHALKING	CRACKING	FLAKING	DIRT	MILDEW	DARKENING	FADING
HESS 07	Minex 4	BLUE	8.75	10.00	10.00	10.00	8.88	8.88	10.00	8.75
HESS 07	Minex 4	WHITE	7.28	10.00	10.00	10.00	7.88	6.88	7.38	-
GRAND AVERAGE:			8.07	10.00	10.00	10.00	8.38	7.88	8.69	8.75
HESS 08	SafSil CT200	BLUE	8.75	10.00	10.00	10.00	8.88	8.88	10.00	10.00
HESS 08	SafSil CT200	WHITE	7.28	10.00	10.00	10.00	7.88	6.88	7.38	-
GRAND AVERAGE:			8.07	10.00	10.00	10.00	8.38	7.88	8.69	10.00
HESS 09	NCS-8	BLUE	8.75	10.00	10.00	10.00	8.88	8.88	10.00	9.50
HESS 09	NCS-8	WHITE	7.28	10.00	10.00	10.00	7.88	6.88	7.38	-
GRAND AVERAGE:			8.07	10.00	10.00	10.00	8.38	7.88	8.69	9.50
HESS 10	NCS-10	BLUE	8.75	10.00	10.00	10.00	8.88	8.88	10.00	9.75
HESS 10	NCS-10	WHITE	7.28	10.00	10.00	10.00	7.88	6.88	7.38	-
GRAND AVERAGE:			8.07	10.00	10.00	10.00	8.38	7.88	8.69	9.75
HESS 11	NCS-11	BLUE	8.75	10.00	10.00	10.00	8.88	8.88	10.00	10.00
HESS 11	NCS-11	WHITE	7.28	10.00	10.00	10.00	7.88	6.88	7.38	-
GRAND AVERAGE:			8.07	10.00	10.00	10.00	8.38	7.88	8.69	10.00
HESS 12	NCS-12	BLUE	8.75	10.00	10.00	10.00	8.88	8.88	10.00	10.00
HESS 12	NCS-12	WHITE	7.28	10.00	10.00	10.00	7.88	6.88	7.38	-
GRAND AVERAGE:			8.07	10.00	10.00	10.00	8.38	7.88	8.69	10.00

Averaged 38 Months Exposure | 10 = Perfect • 0 = Failure

## SCRUB RESISTANCE (ASTM D-523)

Based on Southern Exposures data, scrubs on the 4 pigments tested. Higher numbers better.

PIGMENT	NUMBER OF CYCLES
HESS NCS-12	1097
HESS NCS-15	1126
MINEX	1021
SIL-CO-SIL	989

## FINENESS OF DISPERSION (ASTM D-1210)

HEGMAN FINENESS OF GRIND	
HESS NCS-12	5
HESS NCS-15	5
MINEX 4	5

## BURNISH

% INCREASE	
HESS NCS-12	60
HESS NCS-15	59
MINEX 4	61

## POROSITY (STAIN RESISTANCE)

REFLECTANCE RETAINED	
HESS NCS-12	100
HESS NCS-15	99.97
MINEX 4	99.97

## OIL ABSORPTION (ASTM D-281-95)

PIGMENT	DETERMINED VALUE
HESS NCS-12	30.8
HESS NCS-15	30.05
MINEX 4	23
SIL-CO-SIL	22

## WHITENESS

These drawdowns were measured by Southern Exposures using the exact same paint formulas with the only variable being the pigment used (same volume of each pigment in each formula).

DRAWDOWN #1	Berger	CIE	ASTM E313
	Whiteness	Whiteness	Yellowness
HESS NCS-15	83.50	82.93	1.33
MINEX 4	84.11	83.67	1.68
DELTA	-0.61	-0.74	-0.35
DRAWDOWN #2			
HESS NCS-12	83.13	82.57	1.55
MINEX 4	83.07	82.61	1.80
DELTA	0.5	-0.03	-0.25